

FIG. 1

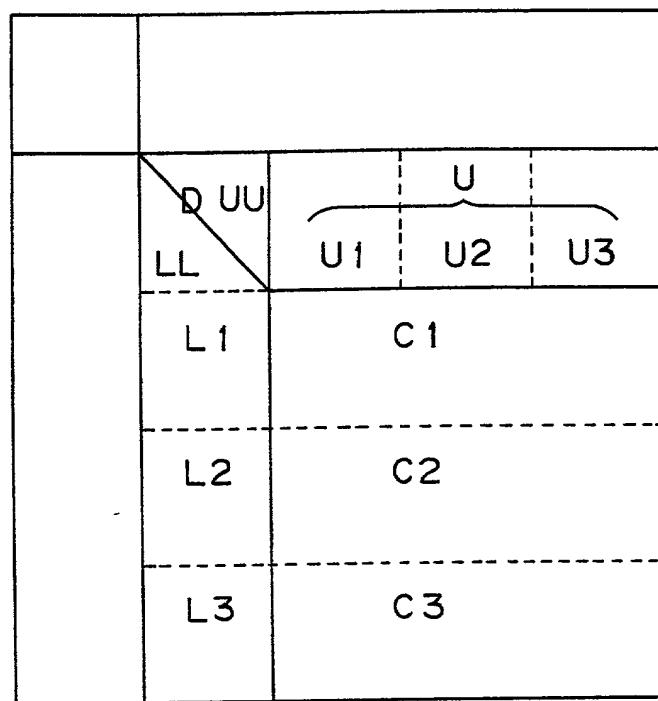


FIG. 2

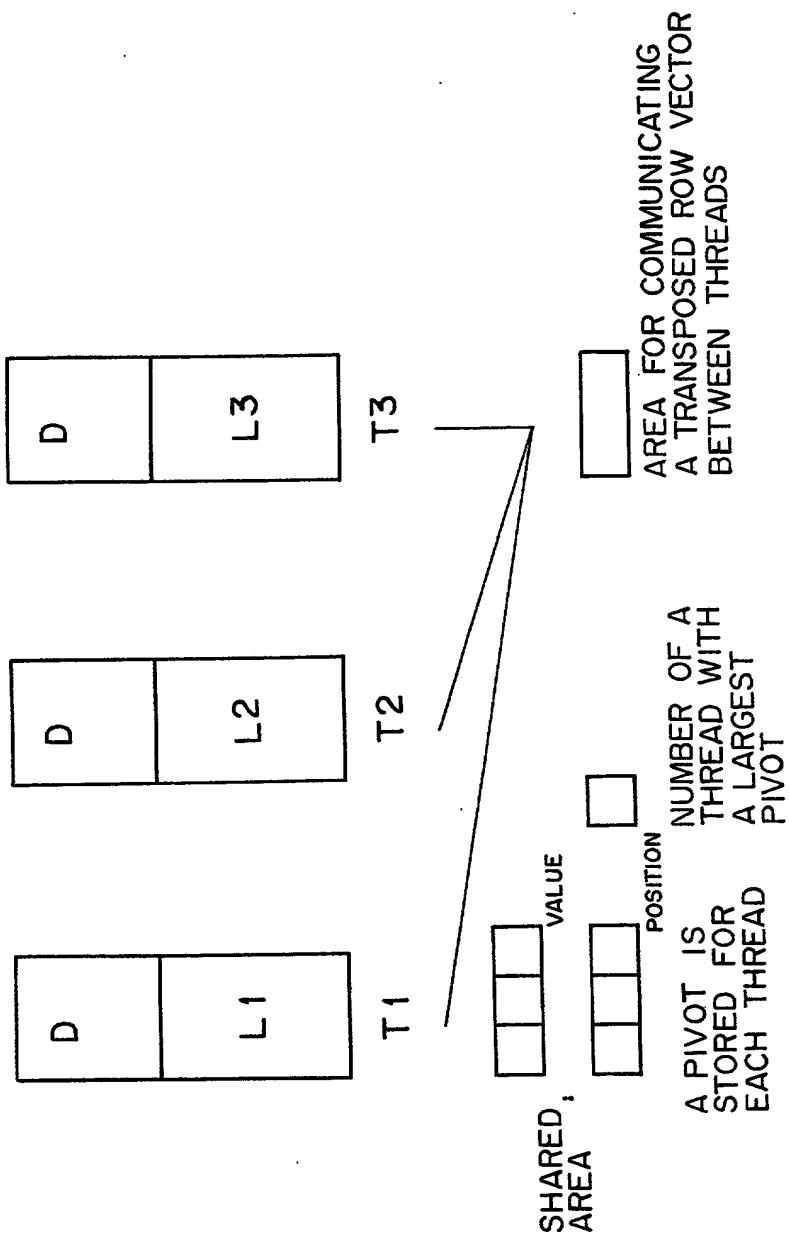


FIG. 3

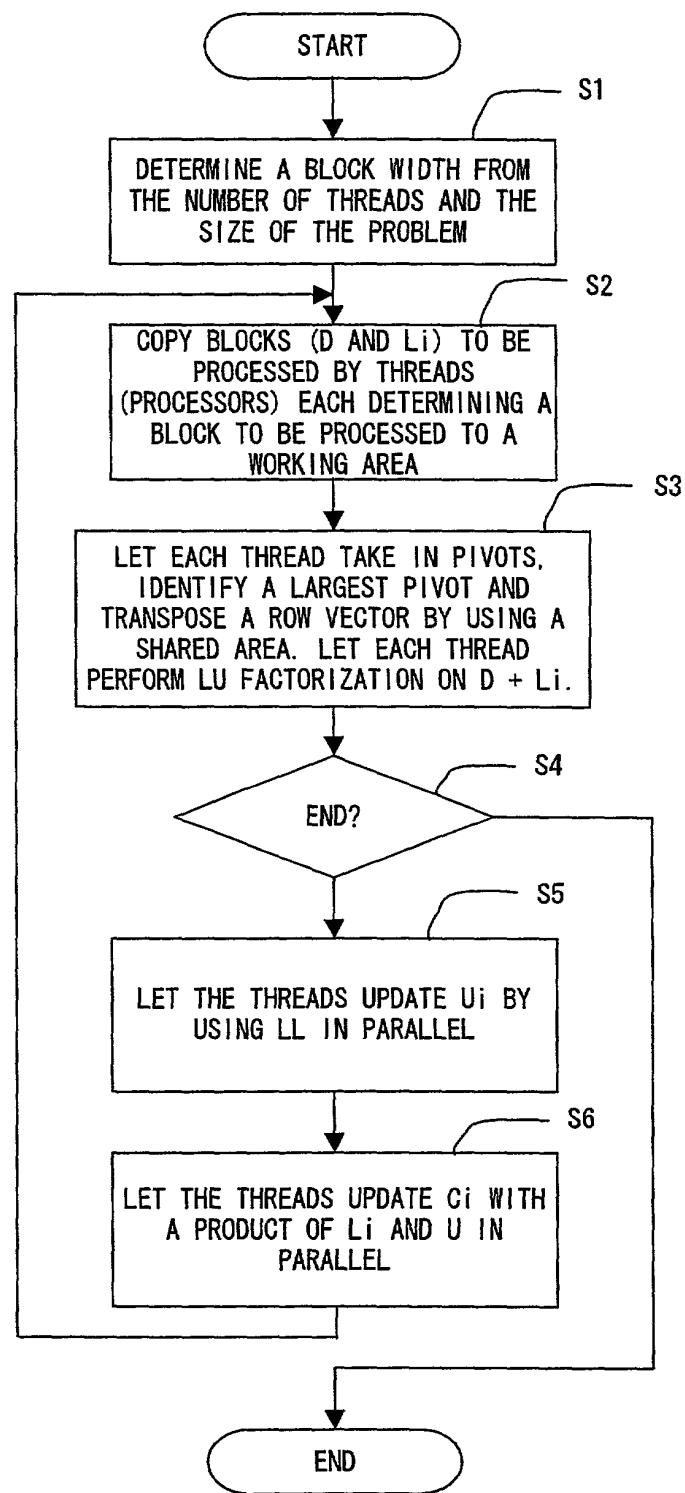


FIG. 4

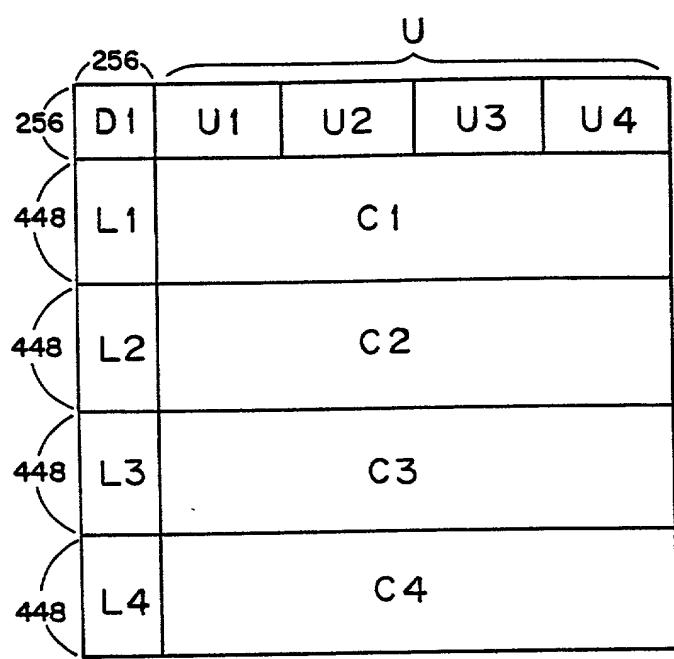


FIG. 5

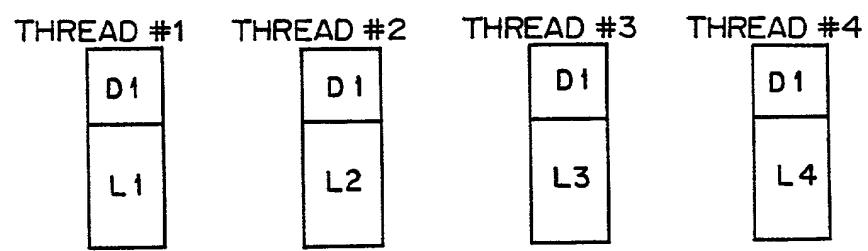
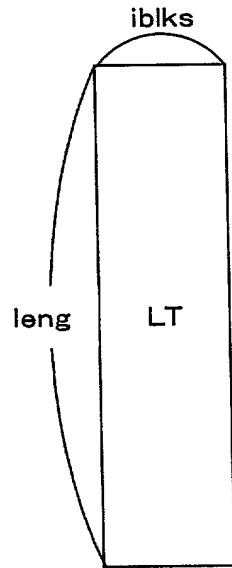


FIG. 6



```

DO i=1, iblks
  TMP=0,0 DO;jj=0
  DO j=i, leng
    IF(ABS(LT(j, i)), GT , TMP)THEN
      TMP=ABS(LT(j, i))
      jj=j
    ENDIF
  ENDDO

```

(1)

```

IF(jj, GT, i) THEN
  DO k=1, iblks
    TMPX=LT(i, k)
    LT(i, k)=LT(jj, k)
    LT(jj, k)=TMPX
  ENDDO
END IF

```

(2)

```

DO k=i+1, iblks
  LT(i, k)=LT(i, k) LT(i, i)
ENDDO

```

```

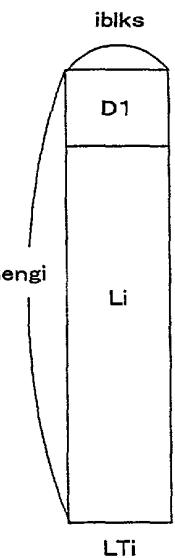
DO k=i+1, iblks
  DO l=i+1, leng
    LT(l, k)=LT(l, k) LT(l, i) LT(i, k)
  ENDDO
ENDDO

```

(3)

ENDDO

FIG. 7



```

DO i=1, iblks
  TMP=0,0 DO ;jj=0
  DO j=1, lengi
    IF(ABS(LTi(j, i)), GT , TMP)THEN
      TMP=ABS(LTi(j, i))
      jj=i
    ENDIF
  ENDDO
  pivot(#THREAD)=jj
  (#THREAD IS A THREAD NUMBER. IN THE
  CASE OF PARALLEL PROCESSING BY 4
  THREADS, #THREAD IS PRESCRIBED AS
  1,2,3 AND 4.)
```

(4)

BARRIER SYNCHRONIZATION

```

  IF(#THREAD, EQ, 1)
    jx=0;GPIVOT=0
    DO ix=1, 4
      IF(pivot(ix), GT, jx. AND, PIVOT(ix), GT, iblks) GPIVOT=ix
      (THE NUMBER OF A THREAD HAVING A LARGEST NUMBER)
```

(5)

BARRIER SYNCHRONIZATION

```

  ENDDO
  END IF
  BARRIER SYNCHRONIZATION
```

(6)

IF(#THREAD, EQ, GPIVOT)THEN

```

  IF(jj, GT, i)THEN
    DO ix=1, iblks
      ROW(ix)=LTi(jj, ix)
    ENDDO
  END IF
  BARRIER SYNCHRONIZATION
```

(7)

IF(GPIVOT, EQ, 0)THEN

```

  IF(jj, GT, i)THEN
    DO i=1, iblks,
      TMPW=LTi(i, ix)
      LTi(i, ix)=LTi(jj, ix)
      LTi(jj, ix)=TMPW
    ENDDO
  END IF
  ELSE
    IF(#THREAD, EQ, GPIVOT)THEN
```

(8)

DO ix=1, iblks

```

    LTi(jj, ix)=LTi(i, ix)
    LTi(i, ix)=ROW(ix)
  ENDDO
  ELSE
    DO ix=1, iblks
      LTi(i, ix)=ROW(ix)
    ENDDO
  ENDIF
```

(8)

DO k=i+1, iblks,

```

    LTi(i, k)=LTi(i, k) / LT(i, i)
  ENDDO
```

(9)

DO k=i+1, iblks

```

  DO l=i+1, lengi
    LTi(l, k)=LTi(l, k) - LT(i, i) * LT(i, k)
  ENDDO
  ENDDO
```

(10)

ENDDO

FIG. 8

256	D 1	U 1	U 2	U 3	U 4
384	L 1		C 1		
384	L 2		C 2		
384	L 3		C 3		
384	L 4		C 4		

FIG. 9

subroutine LU(LTi, k, iblks, ist, nwid)
(WHERE LTi IS USED BY THREADS FOR STORING (D1+Li),
k IS THE SIZE OF THE FIRST ONE DIMENSION OF LTi,
iblks IS THE BLOCK WIDTH,
ist IS A POSITION TO START THE Lu FACTORIZATION AND
nwid IS THE WIDTH OF AN OBJECT SUBJECT TO THE Lu FACTORIZATION)
IF(nwid, eq, 8), Then (A WIDTH OF 8 IS A MINIMUM).

LTi(ist:k, ist, ist+nwid-1) IS SUBJECT TO THE LU FACTORIZATION IN
PARALLEL.

HERE, THE PARTS (4) TO (10) OF FIG.9 ARE EXECUTED.

IN THIS CASE, THE ROW-TRANSPOSING UNIT TRANSPOSES
LTi(i, 1, iblks) AT THE LENGTH iblk.

else

call LU(LTi, k, iblks, ist, nwid/2)

call TRS()

UPDATE LTi(ist:ist+nwid/2-1, ist+nwid/2:ist+nwid). BY USING A
LOWER-TRIANGULAR MATRIX LL OF LTi(ist:ist+nwid/2-1, ist:ist+nwid/2
-1), UPDATE IT BY MULTIPLYING IT BY LL⁺ FROM THE LEFT.

call MM()

LTi(ist+nwid/2:k, ist+nwid/2:ist+nwid)

=LTi(ist+nwid/2:k, ist+nwid/2:ist+nwid)

-LTi(ist+nwid/2:k, ist:ist+nwid/2-1) x

LTi(ist:ist+nwid/2-1, ist+nwid/2:ist+nwid)

Barrier SYNCHRONIZATION

call LU(LTi, k, iblks, ist+nwid/2, nwid/2

end if

return

end subroutine

FIG. 10

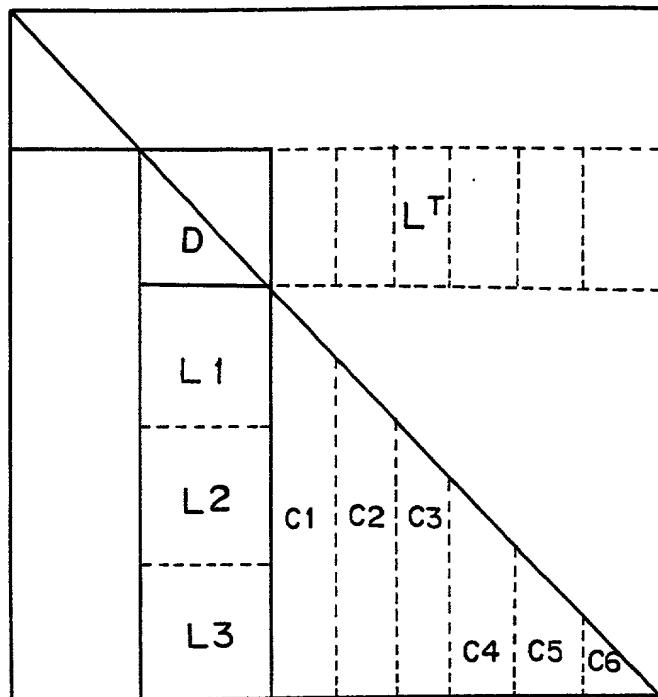


FIG. 11

Y-300220 = 44TP1355

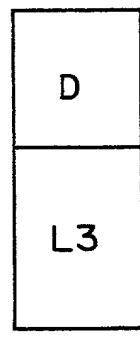
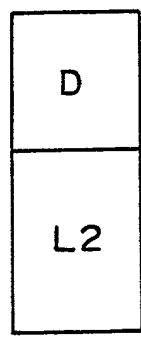
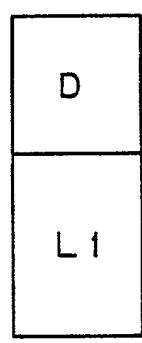
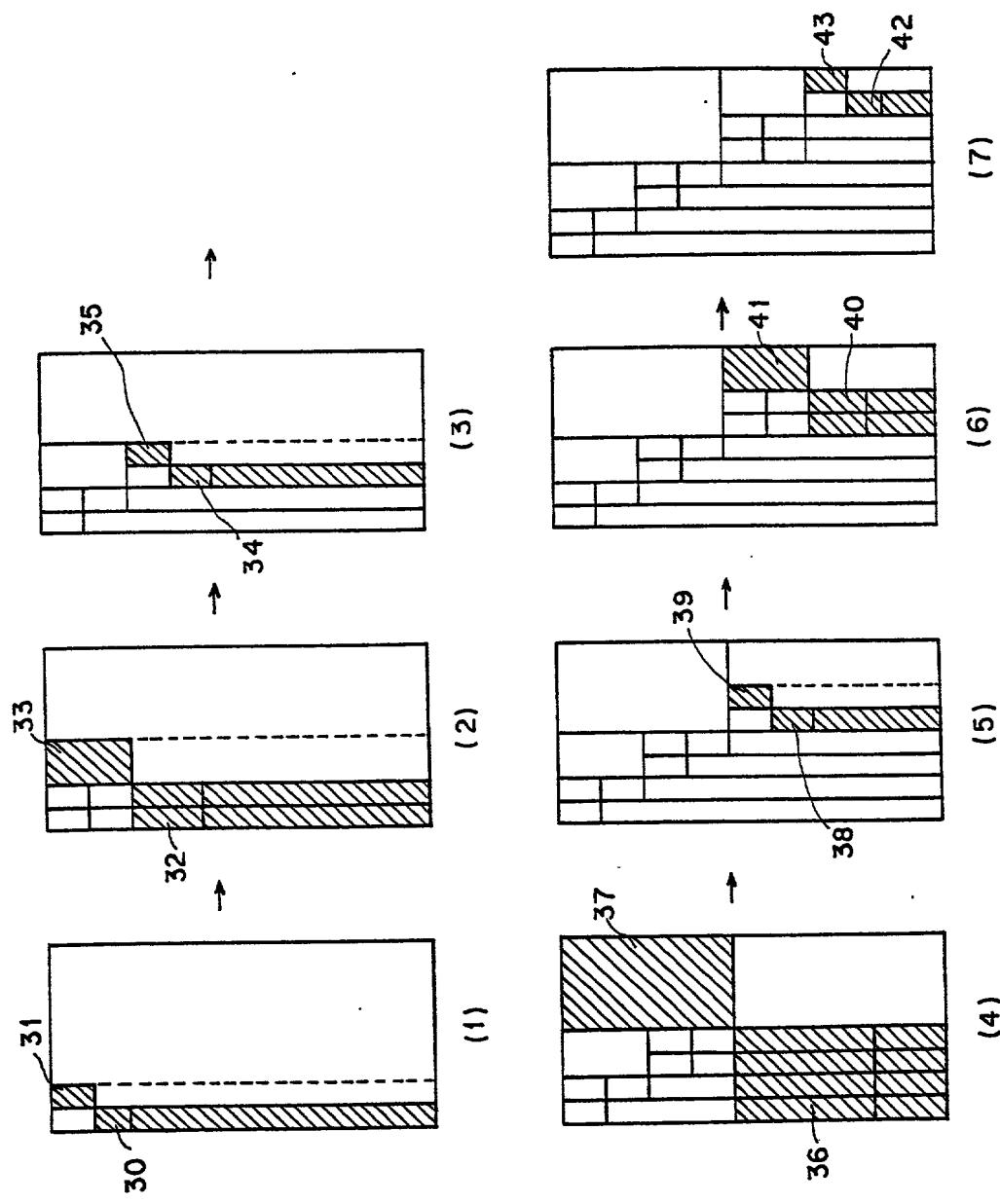


FIG. 12

FIG. 13



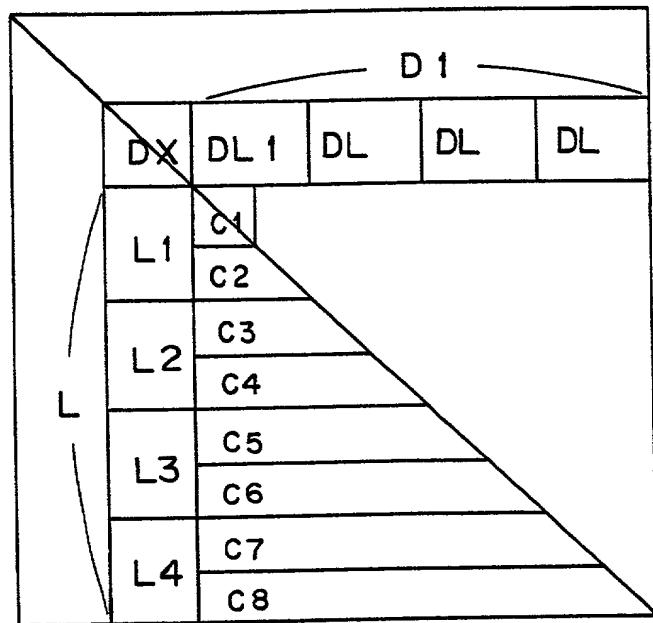


FIG. 14

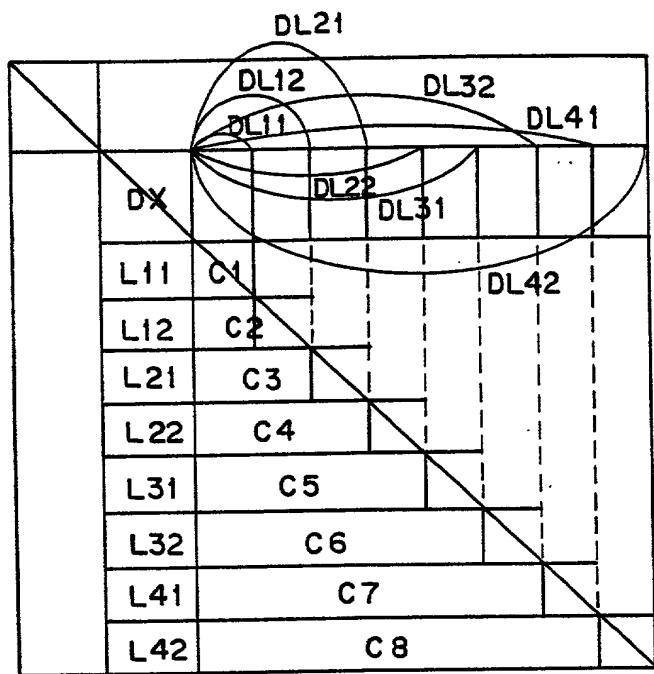


FIG. 15

```

subroutine LTD(LTi, k, iblks, ist, nwid)
IF(nwid, EQ, 8)THEN (THE WIDTH OF 8 IS THE MINIMUM)
  DOI=ist, ist+7
  DOj=i+1, ist+7
    LTi(i, j)=LTi(j, i)
    LTi(j, i)=LTi(j, i) / LTi(i, i)
  ENDDO
  DO jy=i+1, ist+7
    DO jx=jx, ist+7
      LTi(jx, jy)=LTi(jx, jy) - LTi(jx, i) * LTi(i, jy)
    ENDDO
  ENDDO

```

(20)

UPDATE LTi(LTi(ist+8:k, ist:ist+7)).

SINCE DL^T IS INCLUDED IN THE UPPER TRIANGLE OF
 $LTi(LTi(ist:ist+7, ist:ist+7))$, UPDATE $(PL^T)^{-1}$ FROM THE RIGHT.

ELSE

call LDL(LTi, k, iblks, ist, nwid/2)

COPY DL^T TO

$LTi(ist:ist+nwid/2-1, ist+nwid/2:ist+nwid-1)$.

(D IS AN OBJECT ELEMENT OF $LTi(ist:ist+nwid/2-1, ist:ist+nwid/2-1)$)

AND L IS

$LTi(ist+nwid/2:ist+nwid-1, ist:ist+nwid/2-1)$,

TRANSPOSING THIS L^T .)

•UPDATE $LTi(ist+nwid/2:k, ist+nwid/2:ist+nwid-1)$.

$LTi(ist+nwid/2:k, ist+nwid/2:ist+nwid-1)$

$=LTi(ist:ist+nwid/2:k, ist+nwid/2:ist+nwid-1) -$

$LTi(ist+nwid/2:k, ist:ist+nwid-1) \times$

$LTi(ist:ist+nwid/2-1, ist+nwid/2:ist+nwid-1)$

•CALL LDL (LTi, k, iblks, ist+nwid/2, nwid/2)

ENDIF

RETURN

END

F I G. 16